

Managing Data for Clinical Care Delivery and Research

Getting More Bang For Your Buck

Standards & Terminologies

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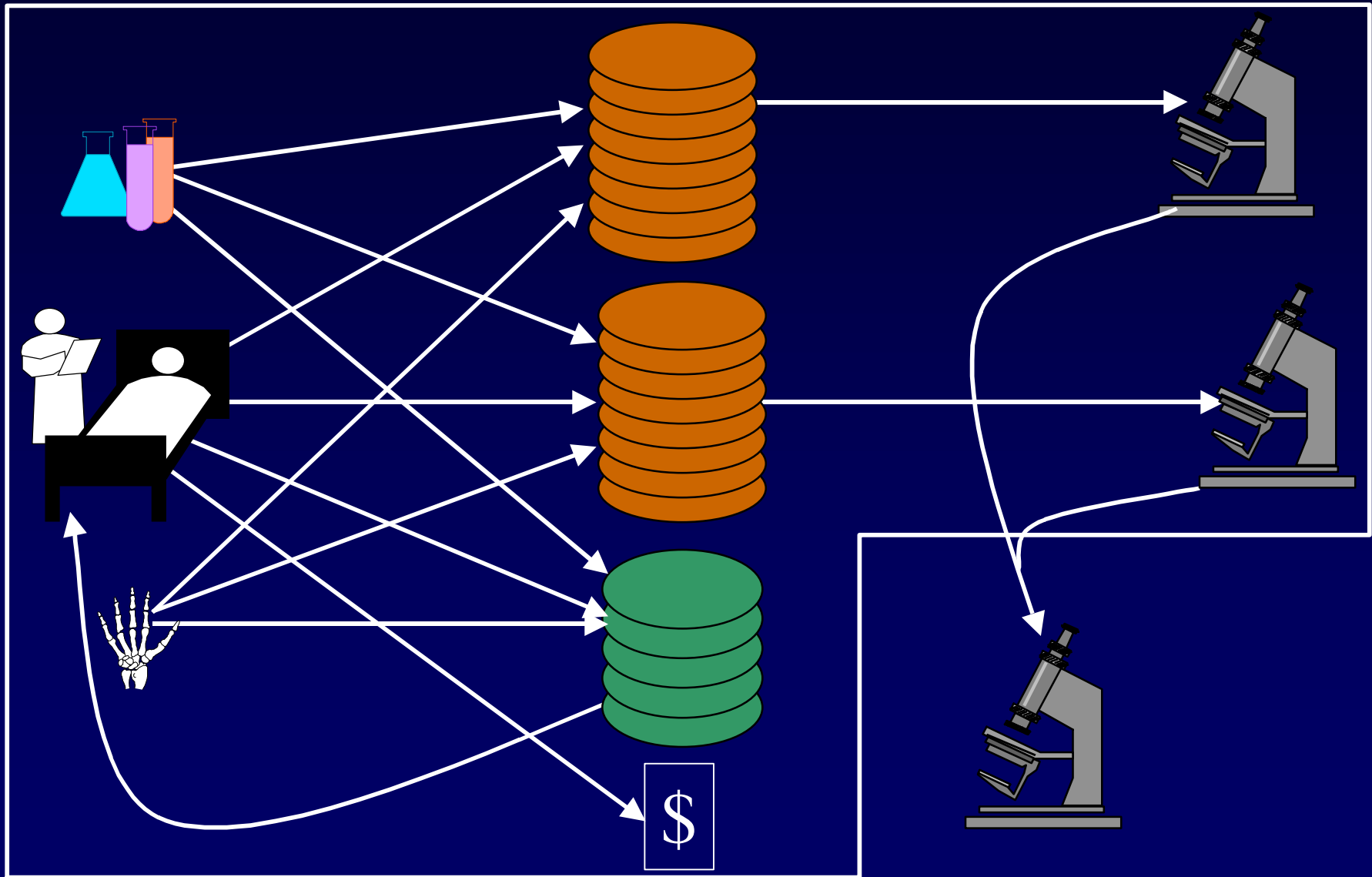
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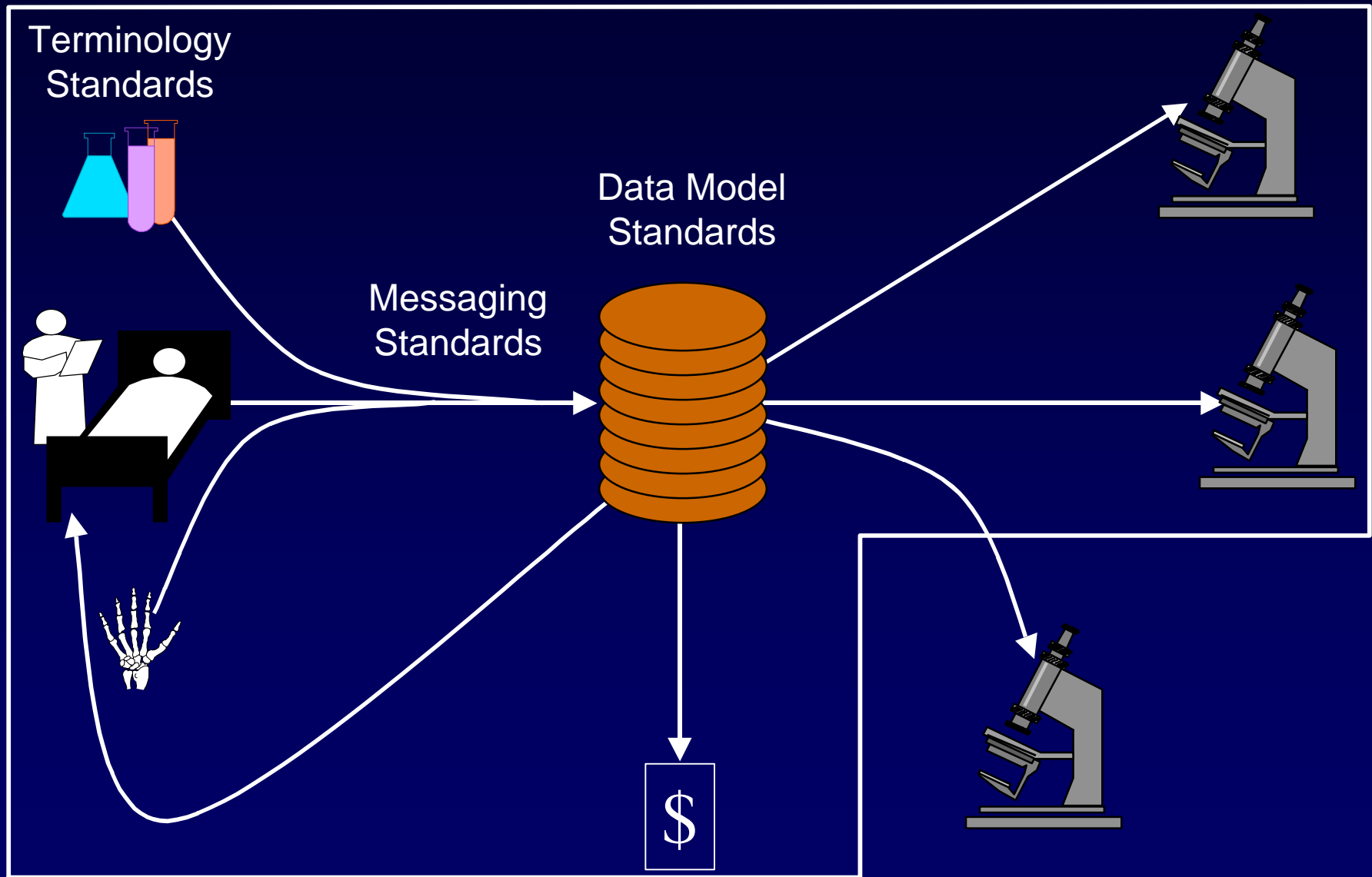
Use and Re-Use of Clinical Data

- Primary use: report back to clinicians
- Secondary uses:
 - Patient care
 - Administrative
 - Research!

Collecting Clinical Data for Research



Standards for Collecting Clinical Data



Nonstandard Terminologies

Study 1:

Low White Count

Tumor Grade I

Serum Glucose

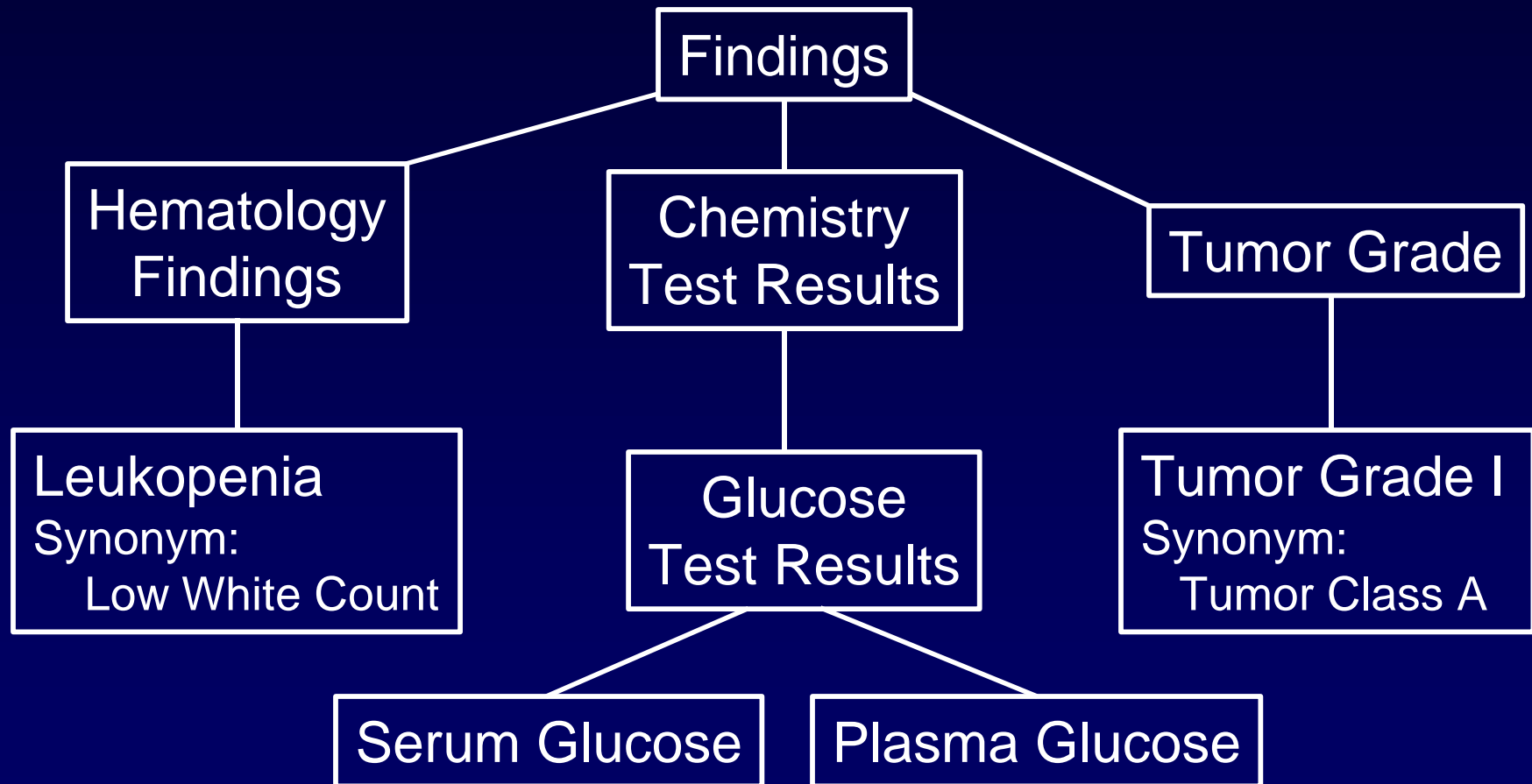
Study 2:

Glucose

Tumor Class A

Leukopenia

Standard Terminology



Terminology Standards

- Coding vs. abstraction
- Intended use vs. ability to re-use
- Granularity of care vs. research concepts
- Classifications
- Pre-coordinated vs. postcoordinated
(e.g., “Right Kidney” vs. “Right” + “Kidney”)

High-Quality Terminology

- Concept-oriented
- Breadth and depth
- Multi-grained
- Multiple classifications
- Maintenance process

Case Studies

- Data summarization

Data Summarization

- Data collected for patient care
- Summaries over time
- Multiple labs/institutions
- Multiple user interfaces

Outpatient Summary

Chen-20	C7 + 22:50 24 Mar 99	Misc.Che+ 10:00 25 Jan 99	Misc.Chen 23:30 24 Jan 99	C7 + 17:15 24 Jan 99	C7 13:35 14 Oct 97	C7 9:15 12 Apr 97	C20 + 18:20 10 Apr 97	C7 10:20 07 Apr 97	C7 10:10 06 Apr 97	C7 10:00 05 Apr 97
Na	138	138		140	142	141		139	137	141
K	4.0	4.0		4.4	4.6	3.7		4.0	3.8	3.7
Cl	107	105		107	108	114		108	107	107
BUN	16	11		11	14	17		18	13	11
Creat	1.7	1.2		1.3	1.3	1.1		1.0	1.0	1.0
Gluc	133	87		94	85	76		82	88	87
Ca	8.0						8.0			
Phos	2.8									
Chol				105 *						
Alb				3.6						
TBili				0.9						
DBili				0.2						
Tot Alk P				70						
AST				47						
ALT				22						
CK		165	155	152						

Inpatient Summary

[illegible]

Case Studies

- Data summarization
- Research recruitment

Research Recruitment

- Data collected for patient care
- Monitoring system detects patterns
- Enrollment criteria can be logically defined

Case Study: Patient Recruitment

- Study of bisphosphonates in hypercalcemia
- Patients treated before enrollment ineligible
- Monitor checked for elevated calcium
- Monitor sent message to research fellow
- Enrollment was complete in two months

Case Studies

- Data summarization
- Research recruitment

Available Standards

- Terminologies
 - ICD9-CM/ICD10/CM
 - SNOMED-RT/CT
 - LOINC

(Baorto DM, Cimino JJ, Parvin CA, Kahn MG. Combining laboratory data sets from multiple institutions using the logical observation identifier names and codes (LOINC). *International Journal of Medical Informatics*. 1998;51(1):29-37.
- Messaging
 - Health Level 7 (HL7)
- Data Models
 - HL7 Reference Information Model (RIM)

Implications for Clinical Research

- Data collected for care can be reused for:
 - Research
 - Recruitment
 - Collaboration
 - Retrospective studies
- Reduce duplication of effort
- Longitudinal consistency
- Sharable and pool-able data